KDE Elgin MH C.C.



**State Water Survey Division**

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ENR
Illinois Department of
Energy and Natural Resources

May 18, 1983

Mr. Thomas H. Johnson
Facility Coordinator
State of Illinois
Department of Mental Health & D.D.
401 South Spring St.
Springfield, IL 62706

Dear Mr. Johnson:

We have received your request through Mr. Chester Neff of our Division for information concerning the capping or abandonment of the two supply wells at the Elgin Mental Health Center. General guidelines for the sealing of abandoned water wells are provided in Rule XI-A of the State of Illinois Department of Mines and Minerals, Division of Oil and Gas (IDMM). The sealing must be performed by a licensed water well contractor or some other person who has been certified by the IDMM and an affidavit must then be filed with the Department verifying the plugging of the well. More details about the filing of the affidavit can be obtained from the IDMM in Springfield. A copy of Rule XI-A has been enclosed. In conjunction with the procedures outlined in this, we would offer the following comments and suggestions.

The two wells at the Health Center are 2000 ft deep and both are open to more than one bedrock aquifer. Water flow between the aquifers through the well borehole is possible if the hydraulic head in individual units varies. This can become a problem if the migration is from the deep bedrock intervals, where highly mineralized water often occurs, to upper units containing water of better quality. Available data neither confirm nor rule out whether vertical movement of the groundwater is taking place in either of the wells. However, proper sealing of the wells is imperative to eliminate communication between the aquifers in the event future groundwater withdrawals in this region modify conditions.

One possible way to seal the wells would be to fill the entire casing and open borehole with neat cement or cement grout. The available information suggests that Well No. 1 would require a minimum of about 148 cubic yards of cement and Well No. 2 about 69 cu. yd. of cement. More cement may be required depending on the number and size of any bedrock fractures, crevices, or solution channels intersected by the well borehole. Development with explosives, as performed on at least one of the wells (No. 2), can cause enlargement of the borehole requiring an unknown additional amount of fill material. A special cement may be necessary if the chloride content of the water is high.

Before placing the cement, all pumping equipment and plumbing would need to be removed. The well bore should then be bailed to clean out sand or rock material that might have sloughed off the borehole wall and

into the well casing (bottom set at 1010 ft). Pea gravel, puddled clay or concrete can be used above this to about 830 ft where a 50 ft thick cement plug should be set. The remainder of the well casing to land surface can be filled with concrete or puddled clay (disinfected pea gravel can also be used to within about 100 ft of land surface).

There are probably several more methods using various materials which could be used to properly abandon the two wells. If you have any questions or wish to discuss the matter further, please feel free to contact us.

Sincerely,
ILLINOIS STATE WATER SURVEY

Robert D. Olson

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